DOCUMENT RESUME

ED 101 564 FL 006 401

AUTHOR Clark, Eve V.
TITLE What Should LAD Look Like? Some Comments on Levelt. Papers and Reports on Child Language Development, No. 7.
INSTITUTION Stanford Univ., Calif. Committee on Linguistics.
SPONS AGENCY National Science Foundation, Washington, D.C.
PUB DATE Apr 74
NOTE 14p.

EDRS PRICE MF-$0.76 HC Not Available from EDRS. PLUS POSTAGE
DESCRIPTORS *Child Language; *Cognitive Development; *Language Development; Learning Processes; Phonology; *Psycholinguistics; *Semantics; Speech; Syntax; Verbal Communication; Verbal Development
IDENTIFIERS LAD; *Language Acquisition Device

ABSTRACT

To the question of whether Chomsky's hypothesized Language Acquisition Device (LAD) in young children is an adequate and feasible model of language acquisition, this paper answers that LAD should be reformulated so as to include semantics; that "informant presentation" rather than "text presentation" is responsible for language acquisition; and that nonlinguistic knowledge may be crucial in syntax acquisition. The first argument is supported by experiments which show that learning strategies differ according to whether or not the learner has semantic information. The second argument is supported by experiments which show that parents present semantic-specific and phonology-specific feedback to the learner, and, indirectly, syntactic feedback. Finally, situations are discussed in which nonlinguistic knowledge may be the basis for linguistic hypotheses. The paper's conclusion is that this approach may lead to insight into the link between cognitive development and language acquisition. (AM)

ED101564

WHAT SHOULD LAD LOOK LIKE?
SOME COMMENTS ON LEVELT*

Eve V. Clark
Stanford University

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

PERMISSION TO REPRODUCE THIS COPYRIGHTED MATERIAL BY MICROFICHE ONLY HAS BEEN GRANTED BY
Eve V Clark
TO ERIC AND ORGANIZATIONS OPERATING UNDER AGREEMENTS WITH THE NATIONAL INSTITUTE OF EDUCATION. FURTHER REPRODUCTION OUTSIDE THE ERIC SYSTEM REQUIRES PERMISSION OF THE COPYRIGHT OWNER

Papers and Reports on Child Language Development
No. 7

April, 1974

FL006401

---

* Discussion paper presented at the Colloquium on 'Die Rolle der Grammatik in der interdisziplinären linguistischen Forschung,' Zentrum für interdisziplinäre Forschung, Universität Bielefeld, December 11-15, 1973. Preparation of this paper was supported in part by the National Science Foundation, GS-30040.

1.0 The previous paper by W.J.M. Levelt, "Grammatical inference and theories of language acquisition," has raised some important points about the validity of the Language Acquisition Device (LAD) that has been posited as an explanation of how the child learns language. Levelt has brought up two issues: first, whether LAD is adequate in principle, which he argues has not been shown, and secondly, whether LAD is a feasible model of language acquisition. (As a model, it has virtually been ignored within current language acquisition research.) Levelt's paper constitutes a much-needed airing of the issues related to a model like LAD; he makes a strong case against LAD in its present form, and appears to be suggesting that an empirical, rather than a rational, approach might be a more profitable one to pursue. I shall argue, however, that, first, there is evidence from work on the learning of artificial languages that should lead us to reformulate LAD so as to include mechanisms pertinent to semantics as well as to syntax. Once this change is effected, it becomes possible to argue that the child actually acquired language on the basis of informant presentation rather than text presentation. Furthermore, the restricted nature of the input to the child raises questions about the validity of using learnability criteria from computer science. Thirdly, I shall discuss a little of the recent work on the cognitive basis for language acquisition, and suggest that the child's non-linguistic knowledge may also play a crucial role in the acquisition of syntax.

2.0 LAD: Syntax and Semantics

In Chomsky's early discussions of the form taken by LAD, he minimized the role of semantics, and suggested that it was unrelated to the mechanism of language learning although it might provide the motivation for learning (e.g. Chomsky, 1962). Later, Chomsky took a somewhat stronger position which appears to have been based on an experiment by Miller and Norman (1964). In this experiment, subjects had to discover the rules for producing admissible strings of letters in a miniature language. The subject began by typing on a computer what he thought might be a grammatical string; if it was, the computer went through various operations corresponding to the letters used (this acted as the semantic reference system for the language); if the string was not admissible, the computer simply typed the word wrong. Miller and Norman (1964) found that subjects learning the language with semantic reference appeared to learn in exactly the same way as subjects not given any semantic information. This led Chomsky to claim:

> "Thus it has been found that semantic reference ... does not, apparently affect the manner in which the acquisition of syntax proceeds; that is, it plays no role in determining which hypotheses are selected by the learner [Chomsky, 1965, p.33]."

However, as Moeser and Bregman (1972) have pointed out, semantic reference in the Miller and Norman study is only incorporated after the subject had produced a syntactically correct sequence of letters. Since the semantic input was not available at the time when subjects were making their hypotheses about syntactic structure, it is hardly surprising that it did not affect these hypotheses. More important, though, is the fact that this kind of experiment cannot be said to tell us anything about the possible role of semantics in the formation of hypotheses about syntax.

Moeser and Bregman (1972) have recently explored the effects of knowledge of a small 'referent world' on the acquisition of syntactic rules in several miniature languages, of differing complexity, used to describe that world. The miniature linguistic systems were presented under four different conditions: (i) words-only where the subject received no semantic information at all; (ii) arbitrary word-figure relations between the language and the referents; (iii) word-figure correlation where visual design features in the referent figures indicated the class-membership of words; and (iv) syntax-correlation, where words referred to figures that incorporated both visual design features that defined class-membership and visual reasons for selection restrictions at the syntactic level.

The results suggest very strongly that the strategies employed in learning the miniature linguistic systems differed depending on whether the subjects were given semantic information or not. If they had the semantic referents (the figures) present during learning, their strategy appeared to consist of (a) associating each word with its referent; (b) learning the specific rules of the reference field (the ways in which the referent figures were organized); and (c) learning to map words referring to the relevant aspects of the visual field onto the sentence positions. Thus, subjects in the syntax-correlation condition reliably learnt significantly more about the syntactic rules than those in the words-only condition. In the latter (words-only), subjects tended to try to learn the relative positions of words (cf. Braine, 1966, 1971), and failed to learn most of the syntactic rules. Some subjects in the second condition (arbitrary word-figure relations) also tried to learn word positions, although more of them attempted to use the semantic strategy of learning the association between words and figures. This semantic strategy was also used in the word-figure correlation condition.

These results led Moeser and Bregman to conclude that:

> "It is only when the elements in the reference field mirror the syntactic constraints of the language that complex grammatical relations are easily acquired. As the only major difference among the three semantic reference conditions was the way in which the referent field was organized, it appears that the information obtained from this perceptual organization plays an important role in the learning of grammatical relations [1972, p. 769]."

These data strongly suggest that semantic information does affect the manner in which the subject (or child) approaches the learning of syntactic rules, contrary to Chomsky's (1965) assumption. Without any semantic information, subjects simply tried to learn the relative positions of words. In contrast, when they were given semantic information, they used very different strategies, first associating word and referent, then learning how the referent field was organized, and finally mapping that knowledge onto the relative positions of words.

One important conclusion that could be drawn from this is that the notion of LAD, the Language Acquisition Device, should be modified so as to include semantics. This is particularly important if it is indeed the child's organization of non-linguistic knowledge about the properties of objects and their relations in the world that provides the basis for his first linguistic hypotheses about the structure of his first language. This approach suggests that more attention should be paid to the non-linguistic knowledge that the child relies on in working out the semantics and the syntax of his first language. Some preliminary steps have already been taken in this direction by a number of researchers in the field of language acquisition. These will be discussed further in Section 4 below.

3.0 The nature of the input

One assumption that seems to be implicit in the discussions of learnability is that the input consists of the utterances possible in English, and not a simplified subset of such utterances. A number of early discussions have made fairly strong claims on the basis of impressionistic analyses of adult-to-adult speech when considering the input data available to the child. Bever, Fodor and Weksel (1965), for example, characterized adult speech as being full of performance errors (false starts, lapses of memory, changes in construction, pauses, hesitations, etc.) and implied that this was all the child received by way of language data. Other investigators have assumed that most of the input comes from adult-to-adult speech overheard

by the child. From this, it has been concluded that the child could not possibly learn the syntax of his language unless he was endowed with some innate, language-specific, mechanism for just that purpose.

Many of these claims have since been modified. Labov (1970) has contested the view that most adult-to-adult speech is ungrammatical and full of errors, and has shown that it is actually almost error-free. Furthermore, other investigators have found that adult-to-child speech actually differs markedly from adult-to-adult speech. For example, adults generally use short, simple, completely grammatical utterances to young children (Brown and Bellugi, 1964). In several studies that included adult-to-adult and adult-to-child comparisons, it was found that adults use much shorter, simpler sentences, with less embedding and fewer inflections the younger the children being addressed (e.g. Sachs, Salerno and Brown, 1972; Snow, 1972a). Adults also tend to pause exclusively at sentence boundaries with very young children, though not with older children where pauses occur equally often within the sentence (e.g. Broen, 1972). Syntactically, adults appear to use more and more complex structures as the child gets older; it is not clear how closely this is matched to the child's own development but there is some evidence that the child's level of comprehension may play a role in which structures are selected by the adult (Ervin-Tripp, 1971; Shipley, Smith and Gleitman, 1969; Snow, 1972b). Adults speaking to children tend to use many fewer negative sentences, but many more questions. Ervin-Tripp (1970) has suggested that this is because the adult is continually checking to find out whether the child has understood or not. Speech to young children is characterized by exaggerated-sounding intonation patterns, and high pitched, fairly slow delivery. It also contains a high incidence of repetitions, and an even higher one of paraphrases (Snow, 1972a).

Adult-to-child speech also seems to contain, on the adult's side, a number of explicit training situations. New lexical items are presented in familiar frames, e.g. Here's a _____, Look at the _____. The child's own utterances are expanded to the adult form, or else the adult does what has been called 'modelling,' i.e. taking the child's utterance and saying other things about the same situation, e.g. Child: This rabbit, Adult: Yes, rabbits have very soft fur and long ears, don't they?. Adults also present the child with question-answer sequences that could be regarded as models for conversational interchange as well as a source of information about word classes, e.g. Adult: Where's the ball? Here's the ball. The adult speaks more slowly, uses routines, and through the 'training sequences' provides the child with a good deal of explicit information about the segmentation of utterances, word class membership and syntactic relations (cf. Clark, in press).

The modifications made in adult-to-child speech are similar in some respects to the kinds of modifications commonly made to foreigners who do not speak your language (Ferguson, 1971). Furthermore, they are early learnt by the child who is still trying to master the adult language. Shatz and Gelman (1973), for example, found that even four-year-olds systematically modified their speech in addressing two-year-olds (cf. also Berko Gleason, 1973).

These modifications on the part of adults and older children in addressing younger children suggest that the input that the child has to work on in constructing a grammar for his language is specifically simplified so as to make certain structural properties easier to learn. Clearly, this issue requires further investigation, but it does raise the question of whether the learnability criteria applied to different language types in computer science can be applied directly to natural language. The actual input data changes in complexity as the child's knowledge of the language structure increases.

I would like next to turn to the two learning situations discussed by Levelt: text presentation versus informant presentation. With text presentation, one simply gets language input, and receives no further information. The child has to assume that the input sequences are all correct sequences. With informant presentation, on the other hand, one should receive corrections and explicit information about impossible as well as possible sequences. Many investigators have been struck by the fact that parents do not correct their children's sentence structure (e.g. Brown, 1973; Brown and Hanlon, 1970), and, because of this, Braine (1971) concluded that the child receives the equivalent of text presentation only, whereas informant presentation seems to be necessary for learning. Since children do learn language we will have to re-examine this question of text presentation vs. informant presentation from a slightly different viewpoint.

If LAD is reformulated to include those mechanisms necessary for the acquisition of semantic structure as well as of syntax, then it could be argued that the child actually receives informant presentation about his first language. Parents first of all convey to the child very directly whether or not they have understood him. Non-comprehension presumably pushes the child to try other forms to express his meaning. Secondly, parents do make explicit semantic corrections, and approve or disapprove the child's utterance on the basis of its truth value. In other words, parents give the child feedback about whether his utterances constitute a good 'match' for the situation they are apparently meant to describe, e.g.

Child: There's the animal farmhouse.
Parent: No, that's the lighthouse.

As Brown and Hanlon (1970) pointed out:

> "Approval and disapproval are not primarily linked with the truth value of the proposition, which the adult fits to the child's generally incomplete and often deformed sentence. And so, though Eve makes a grammatical error when she expresses the proposition that her mother is a girl with the utterance He a girl, the proposition itself is true and since it is the proposition rather than the grammar that governs response, the response is approving.
>
> ...While there are several bases for approval and disapproval, they are nearly always semantic or phonological. Explicit approval or disapproval of either syntax or morphology is extremely rare in our records, and so seems not to be the force propelling the child from immature to mature forms [pp. 47-48]."

Truth value, therefore, seems to be more important than syntactic form; and truth value is fairly directly tied to the semantics used by the child, as in the correction of the child's naming cited above. This form of correction is found in the early diary studies, and would obviously provide the child with direct information about category names, category boundaries and appropriate descriptions for relations and events.

The lack of parental feedback specific to syntax may not matter if, as Moeser and Fregman's (1972) data suggest, semantics itself is integral to the acquisition of syntactic structure. We could suppose that the child too starts by trying to match up words with the objects around him, on the basis of knowledge he already has (e.g. Clark, 1973a, 1974). At the same time, he begins to look for correlations between his non-linguistic knowledge of how objects and events are structured, and the sequences of words used by the adult to describe particular situations.

4.0 A cognitive basis for language

The child spends the first year or two of his life taking in his surroundings and organizing his knowledge about them. He learns a good deal about the properties of different objects (their shape, size, ability to move or make a noise, etc.) and about possible relations between objects (e.g. that object x can move, and can move y, but not vice-versa; that object z has a certain orientation, etc.). It is this kind of non-linguistic knowledge that often appears to be the basis for the child's first hypotheses about what words mean.

His dependence on such knowledge is clearly shown by his over-extensions of words where his first hypotheses about word meanings seem to be of the form: "A word refers to some identifiable [perceptual] attribute of the object pointed to." This leads the child to assume that the feature (or set of features) he has picked out *is* the meaning of that particular word, so that any other objects that 'match' on the feature(s) in question can be named by the same word (Clark, 1973a, 1974). As a result the word *dog* may, for a while, be used to refer to horses, cats and sheep as well as to dogs.

The non-linguistic basis for the linguistic hypothesis is fairly clear in the case of the over-extension data. It is less clear, however, when we come to the child's hypotheses about relational terms such as prepositions or verbs. What kind of non-linguistic basis does the child have for his hypotheses about linguistic structures such as *The rabbit is under the bush*, *The man threw the rock*, or *The boy picked up the rabbit after he shut the door*? Although there has been an increasing interest in the kinds of strategies that children bring to the task of learning language (e.g. Bever, 1970; Slobin, 1973), as Levelt points out, there has been very little research on whether these strategies are specifically derived from the linguistic input provided to the child, or whether they might have some more general cognitive source. If the child is relying on non-linguistic knowledge in analyzing and interpreting his linguistic input, the same (non-linguistic) strategies should show up in tasks where there is no linguistic input. It could then be argued more plausibly that these cognitive strategies provide a basis for hypotheses about the meaning of language structures.

In a recent study of the acquisition of locatives like *in*, *on* and *under*, I found that very young children (aged 1;6 - 2;6) depend on certain non-linguistic strategies prior to comprehension of the prepositions. The strategies were used both in the comprehension tasks they were given and in other tasks where the child simply had to copy some array. I argued from this that the child's first hypotheses about the meanings of prepositions like *in* and *on* are based on his non-linguistic strategies. Because of this, some meanings could be regarded as cognitively simpler than others. The child should then find it much easier to learn the meanings of those words where his non-linguistic strategies happen to coincide with the actual meaning (Clark, 1973c).

There are a number of other studies that could be interpreted in a similar way. In the acquisition of *more* and *less*, for example, it could be a non-linguistic strategy ("Choose the greater amount") that provides the basis for child's linguistic hypothesis about the

feature [+Polar]. The word more should be easier to learn than less because responses based on the strategy coincide with the real meaning of more. This argument could also be extended to the positive members of many dimensional adjective pairs. The non-linguistic strategy of choosing the more extended object coincides with the meaning of the positive adjectives (Donaldson and Wales, 1970; Klatzky, Clark and Macken, 1973; Clark, 1973c).

Both Schlesinger (1971) and Bowerman (1973) have suggested that the child relies on semantic and cognitive information about classes of objects in coming to understand grammatical relations such as Subject-of and Object-of. In this instance, the non-linguistic knowledge on which the child could be relying might be the following: The child knows that certain objects (or classes of objects) are able to perform particular actions, and that these actions result in a change in a further class of objects at a subsequent time. This could lead the child to make the linguistic hypothesis that Agents are always talked about before Actions or the Objects they affect, and hence to rely on a consistent parsing hypothesis that Noun-Verb-Noun sequences are to be interpreted as Agent-Action Object (e.g. Bever, 1970). On the other hand, it could be that the child has simply formed his linguistic hypothesis from the typical (adult) use of active sentences in English. At the moment, we have no way of deciding which of these accounts is the more viable.

Another situation in which the child may be relying on non-linguistic knowledge for his linguistic hypotheses is that in which the child uses order of mention in reconstructing the actual order of a series of events. When asked to act out sequences like The girl picked up the rock after she jumped the fence, young children treat the first clause as a description of the first event, and the second as a description of the second event (Clark, 1971; Ferreiro, 1971). They also tend to describe a series of events in the order in which they occurred (Clark, 1973b). The children could be using a non-linguistic strategy of acting-out and talking about events in the order in which they remember them, with the assumption that the events happened in that order. This strategy then leads them to make the linguistic hypothesis that the order of mention always reflects actual order. Here again, there is another possibility: Children may realize that adults normally talk about events in the order in which they occur, and it is this that could underlie their order of mention strategy.

While these present only a few situations in which the child's non-linguistic knowledge might plausibly be argued to underlie his first linguistic hypotheses about the meaning of new linguistic structures, I think it is clear that this approach may eventually provide us with some insight into the processing that links cognitive development and language acquisition. At the same time, this approach in no way constitutes a rejection of rationalism. The child's non-linguistic knowledge gives every appearence of being highly structured according to certain built-in principles. These principles are what allow him to categorize and organize his interpretations of his percepts in such a way that he has a coherent body of non-linguistic knowledge onto which he can then map his first language (cf., e.g. H. Clark, 1973). If we are to find out what LAD really looks like, then we must clearly find out more about the child's own knowledge at the point when he begins to acquire language.

REFERENCES

Berko Gleason, J. Code switching in children's language. In T.E. Moore (ed.) Cognitive development and the acquisition of language. New York: Academic Press, 1973. pp. 159-167.

Bever, T.G. The cognitive basis for linguistic structures. In J.R. Hayes (ed.) Cognition and the development of language. New York: Wiley, 1970. pp. 279-352.

Bever, T.G., Fodor, J.A., and Weksel, W. Theoretical notes on the acquisition of syntax: A critique of 'contextual generalization.' Psychological Review, 1965, 72, 467-482.

Bowerman, M.F. Early syntactic development: A cross-linguistic study with special reference to Finnish. Cambridge: Cambridge University Press, 1973.

Braine, M.D.S. Learning the positions of words relative to a marker element. Journal of Experimental Psychology, 1966, 72, 532-540.

Braine, M.D.S. On two models of the internalization of grammars. In D.I. Slobin (ed.) The ontogenesis of grammar. New York: Academic Press, 1971. pp. 153-186.

Broen, P. The verbal environment of the language-learning child. Monographs of the American Speech and Hearing Association, 1972, 17.

Brown, R. A first language: The early stages. Cambridge, Mass.: Harvard University Press, 1973.

Brown, R. and Bellugi, U. Three processes in the acquisition of syntax. Harvard Educational Review, 1964, 34, 133-151.

Brown, R. and Hanlon, C. Derivational complexity and order of acquisition in child speech. In J.R. Hayes (ed.) Cognition and the development of language. New York: Wiley, 1970. pp. 11-53.

Chomsky, N. Explanatory models in linguistics. In E. Nagel, P. Suppes and A. Tarski (eds.) Logic, methodology, and philosophy of science. Stanford, Calif.: Stanford University Press, 1962.

Chomsky, N. Aspects of the theory of syntax. Cambridge, Mass.: M.I.T. Press, 1965.

Clark, E.V. On the acquisition of the meaning of before and after. Journal of Verbal Learning and Verbal Behavior, 1971, 10, 266-275.

Clark, E.V. What's in a word? On the child's acquisition of semantics in his first language. In T.E. Moore (ed.) Cognitive development and the acquisition of language. New York: Academic Press, 1973. pp. 65-110. (a)

Clark, E.V. How children describe time and order. In C.A. Ferguson and D.I. Slobin (eds.) Studies of child language development. New York: Holt, Rinehart and Winston, 1973. pp. 585-606. (b)

Clark, E.V. Non-linguistic strategies and the acquisition of word meanings. Cognition: International Journal of Cognitive Psychology, 1973, 2, 000-000. (c)

Clark, E.V. Some aspects of the conceptual basis for first language acquisition. In R.L. Schiefelbusch and L.L. Lloyd (eds.) Language perspectives -- Acquisition, retardation and intervention. Baltimore, Md.: University Park Press, 1974. pp. 000-000.

Clark, E.V. First language acquisition. In J. Morton and J.R. Marshall (eds.) Psycholinguistics series. London: Paul Elek (Scientific Books) Ltd., in press.

Clark, H.H. Space, time, semantics and the child. In T.E. Moore (ed.) Cognitive development and the acquisition of language. New York: Academic Press, 1973. pp. 28-63.

Donaldson, M. and Wales, R.J. On the acquisition of some relational terms. In J.R. Hayes (ed.) Cognition and the development of language. New York: Wiley, 1970. pp. 235-268.

Ervin-Tripp, S. Discourse agreement: How children answer questions. In J.R. Hayes (ed.) Cognition and the development of language. New York: Wiley, 1970. pp. 79-107.

Ervin-Tripp, S. An overview of grammatical development. In D.I. Slobin (ed.) The ontogenesis of grammar. New York: Academic Press, 1971. pp. 189-212.

Ferguson, C.A. Absence of copula and the notion of simplicity: A study of normal speech, baby talk, foreigner talk and pidgins. In D. Hymes (ed.) Pidginization and creolization of languages. Cambridge: Cambridge University Press, 1971.

Ferreiro, E. Les relations temporelles dans le langage de l'enfant. Genève: Droz, 1971.

Klatzky, R.L., Clark, E.V. and Macken, N. Asymmetries in the acquisition of polar adjectives: Linguistic or conceptual? Journal of Experimental Child Psychology, 1973, 16, 32-46.

Labov, W. The study of language in its social context. Studium Generale, 1970, 23, 30-87.

Levelt, W.J.M. Grammatical inference and theories of language acquisition. Paper presented at colloquium on "Die Rolle der Grammatik in der interdisziplinären linguistischen Forschung," Zentrum für interdisziplinäre Forschung. Universität Bielefeld, December 11-15, 1973.

Miller, G.A. and Norman, D.A. Research on the use of formal languages in the behavioral sciences. Semi-annual Technical Report, Department of Defense, Advanced Research Projects Agency, 1964. [Reported also by G.A. Miller in 'Project Grammarama,' in G.A. Miller (ed.) The psychology of communication. New York: Basic Books, 1967]

Moeser, S.D. and Bregman, A.S. The role of reference in the acquisition of a miniature artificial language. Journal of Verbal Learning and Verbal Behavior, 1972, 11, 759-769.

Sachs, J.S., Brown, R., and Salerno, R.A. Adults' speech to children. Paper presented at the International Sumposium on First Language Acquisition, Florence, September 1972.

Schlesinger, I.M. Production of utterances and language acquisition. In D.I. Slobin (ed.) The ontogenesis of grammar. New York: Academic Press, 1971. pp. 63-101.

Shatz, M. and Gelman, R. The development of communication skills: Modifications in the speech of young children as a function of listener. Monographs of Society for Research in Child Development, 1973, 38 (Serial No. 152).

Shipley, E.F., Smith, C.S., and Gleitman, L.R. A study in the acquisition of language: Free responses to commands. Language, 1969, 45, 322-342.

Slobin, D.I. Cognitive pre-requisites for the development of grammar. In C.A. Ferguson and D.I. Slobin (eds.) Studies of child language development. New York: Holt, Rinehart & Winston, 1973. pp. 175-208.

Snow, C.E. Mothers' speech to children learning language. Child development, 1972, 43, 549-565. (a)

Snow, C.E. Young children's responses to adult sentences of varying complexity. Paper presented at Third Annual Congress of Applied Linguistics, Copenhagen, August 1972. (b)